

Claims

1. A process for enhancing commercial poultry raising operations, comprising:

supplying a confined space within which poultry chicks are raised, the ^{nf}combined space having a floor area;

placing bedding litter onto the floor area, the bedding litter including citrus byproduct from expressing citrus juice from citrus fruit, the byproduct including citrus peel component and being in a dried state;

confining poultry chicks in the confined space and onto the bedding litter, and feeding the poultry chicks;

continuing said confining and feeding for a length of time adequate for the poultry chicks to grow to poultry of a size suitable for commercial meat supply use; and

removing the poultry from the confined space and noting a quality characteristic of the poultry, the quality characteristic of said poultry being improved when compared with the same characteristic of poultry chicks raised in the same manner but placed upon a pine wood shavings bedding litter.

2. The process in accordance with claim 1, further including noting an adjusted feed conversion value for the poultry raised according to the process, said adjusted feed conversion value being less than that of poultry raised on the pine wood shavings bedding litter.

3. The process in accordance with claim 1, wherein the placing of bedding litter composition is preceded by collecting byproduct from commercial citrus juice extraction, the byproduct being selected from the group consisting of citrus peel, citrus pulp, citrus flavedo, citrus albedo, citrus rag, citrus seed, and combinations thereof, and drying the byproduct to provide a citrus byproduct flake component.
4. The process in accordance with claim 1, wherein the placing of bedding litter composition is preceded by collecting byproduct from commercial citrus juice extraction, treating the byproduct with a chemical to provide a limed byproduct, and drying the limed byproduct into a citrus byproduct flake component being particles having a non-uniform size and shape.
5. The process according to claim 4, further including placing the citrus byproduct flake component onto the floor area in the absence of an extraction being practiced upon the citrus byproduct flake component.
6. The process according to claim 1, further including formulating the bedding litter composition to have between about 10 and about 100 volume percent of dried peel byproduct, and up to about 90 volume percent of a secondary bedding component other than said citrus byproduct.
7. The process according to claim 1, further including formulating the bedding litter composition to have between about 20 and about 100 volume percent of dried peel byproduct, and up to about 80 volume

percent of a secondary bedding component other than said citrus byproduct.

8. The process according to claim 1, wherein said removing and noting includes noting foot pad lesion scores as the quality characteristic of the poultry.
9. The process according to claim 1, wherein the placing of bedding litter places citrus byproduct flake component prepared by drying citrus byproduct from juice expressing equipment and without purifying the citrus byproduct present in the citrus byproduct flake component.
10. The process according to claim 1, wherein the placing of bedding litter places citrus byproduct flake component prepared by drying citrus byproduct from juice expressing equipment and without extracting the citrus byproduct present in the citrus byproduct flake component.
11. A process for enhancing commercial poultry raising operations, comprising:
 - supplying a confined space within which poultry chicks are raised, the combined space having a floor area;
 - placing bedding litter onto the floor area, the bedding litter including citrus byproduct from expressing citrus juice from citrus fruit, the byproduct including citrus peel component and being in a dried state;

confining poultry chicks in the confined space and onto the bedding litter, and feeding the poultry chicks;

continuing said confining and feeding for a length of time adequate for the poultry chicks to grow to poultry of a size suitable for commercial meat supply use; and

removing the poultry from the confined space and noting the adjusted feed conversion achieved by said poultry, said adjusted feed conversion showing greater efficiency than poultry raised under the same conditions but upon a pine wood shavings bedding litter.

12. The process in accordance with claim 11, wherein the placing of bedding litter places citrus byproduct flake component prepared by drying citrus byproduct from juice expressing equipment and without purifying the citrus byproduct present in the citrus byproduct flake component.
13. The process in accordance with claim 11, wherein the placing of bedding litter places citrus byproduct flake component prepared by drying citrus byproduct from juice expressing equipment and without extracting the citrus byproduct present in the citrus byproduct flake component.
14. The process in accordance with claim 11, wherein the placing of bedding litter composition is preceded by collecting byproduct from commercial citrus juice extraction, the byproduct being selected from the group consisting of citrus peel, citrus pulp, citrus

flavedo, citrus albedo, citrus rag, citrus seed, and combinations thereof, and drying the byproduct to provide a citrus byproduct flake component.

15. The process according to claim 11, further including placing the citrus byproduct flake component onto the floor area in the absence of an extraction being practiced upon the citrus byproduct flake component.
16. The process according to claim 11, further including formulating the bedding litter composition to have between about 10 and about 100 volume percent of dried peel byproduct, and up to about 90 volume percent of a secondary bedding component other than said citrus byproduct.
17. The process according to claim 11, further including formulating the bedding litter composition to have between about 20 and about 100 volume percent of dried peel byproduct, and up to about 80 volume percent of a secondary bedding component other than said citrus byproduct.
18. A process for enhancing commercial poultry raising operations, comprising:
 - supplying a confined space within which poultry chicks are raised, the combined space having a floor area;
 - placing bedding litter onto the floor area, the bedding litter including one or more components of peel byproduct from expressing citrus juice from citrus fruit, the byproduct being in a dried state;

confining poultry chicks in the confined space and onto the bedding litter, and feeding the poultry chicks;

continuing said confining and feeding for a length of time adequate for the poultry chicks to grow to poultry of a size suitable for commercial meat supply use; and

removing the poultry from the confined space and noting a quality characteristic of the poultry, the quality characteristic of said poultry being improved when compared with the same characteristic of poultry chicks raised in the same manner but placed upon a bedding litter composition of pine wood.

19. The process in accordance with claim 18, wherein said byproduct components are selected from the group consisting of pectin, demethylated pectin, and combinations thereof, same having been collected by drying citrus byproduct from juice extraction equipment in the absence of purifying the byproduct component.
20. The process in accordance with claim 18, wherein said byproduct components are selected from the group consisting of citric acid, malic acid, other food grade acids, and combinations thereof, same having been collected by drying citrus byproduct from juice extraction equipment in the absence of purifying the byproduct component.
21. The process in accordance with claim 18, wherein said byproduct components are selected from the group

consisting of ascorbic acid, a carotenoid, beta-carotene, beta-cryptoxanthin, lycopene, xanthophyll, and combinations thereof, same having been collected by drying citrus byproduct from juice extraction equipment in the absence of purifying the byproduct component.

22. The process in accordance with claim 18, wherein said byproduct components are selected from the group consisting of naringin, naringenin, narirutin, hesperidin, hesperetin, other flavonoids, and combinations thereof, same having been collected by drying citrus byproduct from juice extraction equipment in the absence of purifying the byproduct component.
23. The process in accordance with claim 18, wherein said byproduct components are selected from the group consisting of sinensetin, tangeretin, nobiletin, other polymethoxylated flavones, and combinations thereof, same having been collected by drying citrus byproduct from juice extraction equipment in the absence of purifying the byproduct component.
24. The process in accordance with claim 18, wherein said byproduct components include a tocopherol, same having been collected by drying citrus byproduct from juice extraction equipment in the absence of purifying the byproduct component.
25. The process in accordance with claim 18, wherein said byproduct components are selected from the group consisting of limonin, nomolin, a limonin glucoside,

d-limonene, and combinations thereof, same having been collected by drying citrus byproduct from juice extraction equipment in the absence of purifying the byproduct component.

26. The process in accordance with claim 18, wherein said byproduct components include pectin, demethylated pectin, citric acid, malic acid, ascorbic acid, a carotenoid, beta-carotene, beta-cryptoxanthin, lycopene, xanthophyll, naringin, naringenin, narirutin, hesperidin, hesperetin, sinensetin, tangeretin, nobiletin, a tocopherol, limonin, nomolin, a limonin glucoside, and d-limonene.
27. The process in accordance with claim 18, wherein said byproduct components includes a pectin, a food grade acid, ascorbic acid, a carotenoid, a citrus originating flavonoid, a citrus originating polymethoxylated flavone, and a tocopherol.
28. A bedding litter composition for poultry raising within confined spaces such as poultry pens, the bedding litter composition comprising citrus byproduct from citrus juice expressing, said citrus byproduct including citrus peel and being in a dried state.
29. The bedding litter composition in accordance with claim 28, wherein said citrus peel byproduct has a moisture content of between about 5 and about 12 percent by weight, based upon the total weight of the citrus byproduct.

30. The bedding litter composition in accordance with claim 28, wherein said bedding litter composition includes between about 10 and about 100 volume percent of said citrus byproduct, and between about 0 and 90 volume percent of a secondary bedding component other than said citrus byproduct.
31. The bedding litter composition in accordance with claim 28, wherein said bedding litter composition includes at least about 20 volume percent of said citrus byproduct and up to about 80 weight percent of a secondary bedding litter component other than said citrus byproduct.
32. The bedding litter composition in accordance with claim 28, further including a secondary bedding litter component which is selected from the group consisting of a woody litter, a dried vegetation component, and combinations thereof.
33. The bedding litter composition in accordance with claim 32, wherein said secondary bedding litter component is wood in shavings form.
34. The bedding litter composition in accordance with claim 28, wherein said citrus byproduct is dried citrus byproduct flake.
35. The bedding litter composition in accordance with claim 28, wherein said citrus byproduct is pelletized dried citrus byproduct.

36. The bedding litter composition in accordance with claim 28, wherein said citrus byproduct includes pectin, demethylated pectin, and combinations thereof.
37. The bedding litter composition in accordance with claim 28, wherein said citrus byproduct includes a food grade citrus-originating acid in its native state as present in dried citrus byproduct from juice extraction equipment.
38. The bedding litter composition in accordance with claim 28, wherein said citrus byproduct component is selected from the group consisting of ascorbic acid, a carotenoid, beta-carotene, beta-cryptoxanthin, lycopene, xanthophyll, and combinations thereof, in its native state as present in dried citrus byproduct from juice extraction equipment.
39. The bedding litter composition in accordance with claim 28, wherein said citrus byproduct component is selected from the group consisting of naringin, naringenin, narirutin, hesperidin, hesperetin, other flavonoids, and combinations thereof, in its native state as present in dried citrus byproduct from juice extraction equipment.
40. The bedding litter composition in accordance with claim 28, wherein said citrus byproduct component is selected from the group consisting of sinensetin, tangeretin, nobiletin, other polymethoxylated flavones, and combinations thereof, in its native

state as present in dried citrus byproduct from juice extraction equipment.

41. The bedding litter composition in accordance with claim 28, wherein said citrus byproduct component is a tocopherol, in its native state as present in dried citrus byproduct from juice extraction equipment.
42. The bedding litter composition in accordance with claim 28, wherein said citrus byproduct component is selected from the group consisting of limonin, nomolin, a limonin glucoside, d-limonene, and combinations thereof, in its native state as present in dried citrus byproduct from juice extraction equipment.
43. The bedding litter composition in accordance with claim 28, wherein said citrus byproduct includes pectin, demethylated pectin, citric acid, folic acid, ascorbic acid, a carotenoid, beta-carotene, beta-cryptoxantin, lycopene, xanthophyll, naringin, naringenin, narirutin, hesperidin, hesperetin, sinensetin, tangeretin, nobiletin, a tocopherol, limonin, nomolin, a limonin glucoside, and d-limonene.
44. The bedding litter composition in accordance with claim 28, wherein said citrus byproduct includes a pectin, a food grade acid, ascorbic acid, a carotenoid, a citrus originating flavonoid, a citrus originating polymethoxylated flavone, and a tocopherol.